Remarks

I. Claim Amendments

Claims 1-21 are pending in this application. With this Response, claims 1, 2, 16, 18 and 19 are amended; and claims 22-25 are newly added. Support for these amendments is shown throughout the specification. In particular, support for the amendment of claim 1 is found at page 7, lines 24-28. Support for claims 23-25 are found in the numerous examples that use a single beta-diketonate ligand and identify a single alkaline earth metal beta-diketonate amine compound. No new matter has been added by these amendments.

II. Indefiniteness Rejection

Claims 12-13 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action considers that the abbreviations "dmtpdeta," "dbeta," and "thteta" are not defined in the specification.

As an initial matter, "dmtpdeta" is defined on page 21, at lines 4-5, as "N,N'-dimethyl-N,N',N"-tripropyldiethylenetriamine."

Furthermore, although the definition for "thteta" is not explicitly found in the specification, the pattern and consistency in naming the 20-plus amine ligands described in the specification provide ample basis for understanding the meaning of "thteta." In the specification, "tb*teta*" refers to "N,N',N",N"'-tetrabutyl*triethylenetetramine*," and "ta*teta*" refers to "N,N',N",N"'-tetraamyl*triethylenetetramine*." See Table 2. Thus, the suffix "teta" clearly refers to "triethylenetetraamine." The "h" is understood to be "hexyl," as is demonstrated by the abbreviation "*th*deta," which refers to "N,N',N"-tri*hexyl*diethylenetriamine." See Table 2. Although the "th" prefix can refer to both "tetrahexyl" (4 alkyl group substitutions) and "trihexyl" (3 alkyl group substitutions), it would be clear to one of skill in the art that tetrahexyl

is the correct usage in "thteta," since tetramine contains four amino groups, each of which can be alkyl substituted. It follows therefore that "thteta" defines the moiety "N,N',N",N"-tetrahexyltriethylenetetramine."

In addition, one of skill in the art could gain an understanding of the chemical structure by reference to contemporaneous technical literature. In an article entitled "Synthesis And Decomposition Kinetics Of Liquid Precursors For Chemical Vapor Deposition (CVD) Of Barium" (Gordon, et al. Proceedings - Electrochemical Society (1999), 98-23 (Fundamental Gas-Phase and Surface Chemistry of Vapor-Phase Materials Synthesis), 270-279), "thteta" is defined in Table 1 as "N,N',N",N"-tetrahexyltriethylenetetramine." A copy of the article is enclosed.

Lastly, we have reviewed the specification and determined that "dbeta," identified in Table 7 as the amine ligand of Example 30, was listed in error. The amine ligand should properly be "dbeda", or dibutylethylenediamine," as shown in Example 31 (Table 7). Both the error and the correction are obvious to one of skill in the art. The error is obvious because the purported triamine of Example 30 would contain only one ethylene group[1], which is chemically incorrect. The correction is obvious as well. Examples 30 and 31 both report the use of an amine having 6 degrees of freedom, which suggests that the same compound is identified. Since all the ligands in Table 7 (other than the erroneous Example 30) use an ethylenediamine ligand, it is logical that Example 30 does as well. The specification is amended with this response to correct this obvious error.

For the foregoing reasons, it is submitted that the abbreviations "dmtpdeta," and "thteta" are understood by one of skill in the art. It is further submitted that "dbeta" is an obvious error,

[1] "eta" stands for "ethylenediamine."

which has been corrected with this response. Thus, the terms are not indefinite, and it is respectfully requested that the rejection be withdrawn.

III. Enablement Rejection

Claims 12 and 13 stand rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the compounds with defined terminology, does not reasonably provide enablement for the compounds of Examples 11, 15, 30, 35, 38 and 39 because the identity of "dmtpdeta," "dbeta," and "thteta" are not discosed in the specification.

For the reasons stated above in addressing the indefiniteness rejection, it is submitted that the compounds are defined by, and thus enabled by, the specification. It is respectfully requested that the rejection be withdrawn.

IV. Claim Interpretation

The Office Action notes that claim 16 recites "alkaline earth metal," but that claims 18 and 19, which depend from claim 16 recite non-alkaline earth metals titanium, bismuth, niobium and tantalum. Claims 18 and 19 have been rewritten and claim 22 has been added to make clear that the non-alkaline earth elements are added *in addition to* the alkaline earth metal compound of claim 16.

V. Rejection over Gordon (USP 5,980,983)

Claims 1-9 and 14-21 stand rejected under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 5,980,983 to Gordon (the '983 patent). Applicants respectfully disagree.

The Office Action refers to Example 14 of the '983 patent (col. 12, l. 30-61) as teaching a liquid alkaline earth beta-diketonate compound containing an amine. A careful reading of the example establishes that the reaction product of Example 14 is a *mixture* of metal beta-diketonate amine adducts. Thus, the reference does not teach or disclose an isolated compound of an

alkaline earth metal beta-diketonate amine adduct as is recited in claim 1, or an alkaline earth metal beta-diketonate amine that is substantially free of a second alkaline earth metal beta-diketonate compound as is recited in claim 24, or compound comprising an alkaline earth metal beta-diketonate amine wherein the beta-diketonate is the same as is recited in claim 25.

The mixture disclosed in the '983 patent contains a plurality of metal beta-diketonates, some of which include two different beta-diketonates bound to the same metal center. The '983 patent teaches that a mixture of metal beta-diketonates is required to obtain a composition that is liquid at temperatures near ambient. This is confirmed at column 4, line 56, of the '983 patent where it states:

> "It is believed that the use of a mixture in which a portion of the metal beta-diketonate compounds contain two or more different types of beta-diketonate ligands promotes the formation of the liquid phase."

Since the mixture is believed to provide the liquid phase, there is no teaching or suggestion of isolating a single alkaline earth metal beta-diketonate amine adduct from the mixture, or of an alkaline earth metal beta-diketonate amine wherein the beta-diketonates are the same. There certainly is no teaching or suggestion of an isolated metal beta-diketonate-amine adduct that is a liquid at 60°C or less.

Because the '983 patent fails to teach an isolated metal beta-diketonate-amine adduct and relies on the formation of a mixture of mixed ligand compounds to obtain a liquid composition, claim 1 and all its dependent claims are not anticipated by the '983 patent. Claims 24 and 25 are also novel for these reasons.

Furthermore, the '983 patent fails to disclose contacting a liquid consisting essentially of a metal beta-diketonate amine adduct, in which the beta-diketonates are the same, with a heated surface. Thus, claim 16 and all its dependent claims are not anticipated by the '983 patent.

The undersigned attorney thanks Examiner Cleveland for the courtesy of an informal telephone conference on January 30, 2004. During that telephone conversation, Examiner Cleveland identified International Published Application WO 98/46617, which was published on October 22, 1998, and thus would be available as prior art under 35 U.S.C. § 102(a). WO 98/46617 contains substantially the same disclosure as the '983 patent and thus does not anticipate the claimed invention for the reasons set forth above.

VI. Rejection over Gordon in view of Sandy

Claims 10-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the '983 patent in view United States Patent No. 4,189,306 to Sandy (the '306 patent). Applicants respectfully traverse the rejection as it pertains to all claims.

The '983 patent and the above-identified application are commonly owned and are assigned to a common assignee. In the January 30 telephone conversation, Examiner Cleveland confirmed that, for the purpose of determining whether an application falls under 35 U.S.C. § 103(c), the above-identified application has a filing date of July 17, 2001. Thus, the application was filed after November 29, 1999, effective date for Section 103(c). As such, the '983 patent is not available as prior art pursuant to the provisions of 35 U.S.C. §103(c), and the rejection may be withdrawn.

WO 98/46617, which was published on October 22, 1998, would be available as prior art under 35 U.S.C. § 102(a)/103. To the extent that the Office Action relies on WO 98/46617 as teaching the same compositions as the '983 patent, applicants submit that the claimed invention is patentable over the '983 patent in view of the '306 patent.

WO 98/46617 discloses that a mixture of alkaline earth metal beta-diketonates is required to form a liquid composition. Example 14, the only example to include an amine in the composition, does not teach or suggest that the amine ligand in any way contributes to the

formation of the liquid phase. Furthermore, there is no teaching or suggestion of an isolated alkaline earth metal beta-diketonate-amine adduct that is a liquid at 60°C or less.

The '306 patent also fails to suggest an isolated alkaline earth metal beta-diketonate-amine adduct that is a liquid at 60°C or less, or an alkaline earth metal beta-diketonate compound that is substantially free of a second alkaline earth compound, or in which the beta-diketonate is the same. The reference discloses isolated iron, manganese, cobalt and nickel compounds containing beta-diketonate and diamine ligands in a ratio of 2:1. These non-alkaline earth compounds are "volatile," meaning that they are substantially completely volatilized by about 250°C (col. 4, l. 39-40); however, with one exception, all of the isolated compounds have melting points well above 60°C. The '306 patent clearly teaches that compounds having a "high" volatility do not necessarily have a low melting point.

According to the Office Action, the '306 patent teaches that "methyl groups in amine adducts...enhance the solubility, stability and volatility of metal beta-dike tones" (Page 10, Section 10, of the Communication mailed July 14, 2003). Applicants have carefully reviewed the '306 patent, but have found no such teaching. At best, it can be said that the '306 patent teaches that stability is achieved when the diamine ligand forms a 5 to 6 member ring with the metal ion (col. 3, l. 37-41). The '306 patent also discloses that the amine constituents can be "either hydrogen or alkyls of 1 to 4 carbon atoms and thus in the diamine, each amino group can be primary, secondary or tertiary" (col. 3, l. 47-51). Although a large number of diamine ligands are disclosed, there is no teaching or suggestion that the presence of an amine ligand in the compound provides a compound that is a liquid below 60°C.

In conclusion, the '306 patent teaches the isolation of metal beta-diketonate compounds that are typically high melting solids. Further, the '983 patent teaches that a mixture of beta-diketonate compounds is required in order to obtain a liquid composition. There is no teaching

or recognition in either patent that an amine ligand plays a role in obtaining a liquid composition. One would not be motivated to isolate the compounds of the '983 patent (with or without an amine ligand) because of the general teaching (confirmed by the '306 patent) that such compounds would be solids. Thus, there is no reason or basis to combine the two references, and even if combined, the references do not teach or suggest the claimed invention. The rejection may be withdrawn.

VII. Miscellaneous

The correspondence address for the attorney of record is changed. Please direct all future correspondence to the following address:

Hale and Dorr LLP
60 State Street
Boston, MA 02109
Tel: 617.526.6015
Fax: 617.526-5000

Applicants note the additional art made of record, but not relied upon (Vaarstra, Hintermaier et al., Baum et al., and Miller et al). None of the prior art references teach an isolated alkaline earth metal beta-diketonate-amine adduct that is a liquid at 60°C or less.

The Commissioner is authorized to charge Deposit Account No. 08-0219 for the fee ($116.00) required for the addition of four new claims. If there are any charges, or any credits, please apply them to Deposit Account No. 08-0219.

Respectfully submitted,

Date: February 9, 2004

Mary Rose Scozzafava, Ph.D.
Reg. No. 36,268

Hale and Dorr LLP
60 State Street
Boston, MA 02109
Tel: 617-526-6015
Fax: 617-526-5000

Amendment Of The Specification With Markings Showing Changes Made

Page 28, line 3:

Table 7. Liquid Amine Complexes of Magnesium Beta-Diketonates

Example	B-diketonate	Amine	#var	Viscosity Centipoises	Molecular Complexity	Vapor P. °C/mtorr
27	tod(4)	dheda(10)	14	110	1.03	158/27
28	3hd(2)	dheda(10)	12	48	1.13	123/31
29	thd(0)	dheda(10)	10	113	0.89	72/27
30	tod(4)	~~dbeta~~(6) dbeda	10	381	0.94	
31	3hd(2)	dbeda(6)	8	54	0.95	